

MEASURING AND MODELING NEGATIVE EMOTIONS FOR VIRTUAL TRAINING

In crisis situations, policemen and other emergency workers regularly face difficult decision making problems. Though clear instructions on how to act are usually given, they often have difficulties in making appropriate decisions, due to a combination of factors including time pressure and heavy emotions. The research presented in this thesis revolves around developing a Virtual Reality training, where trainees will be placed in a virtual emergency scenario in which they have to make difficult decisions while negative emotions are induced. Using various physiological measurements, aspects of the training (e.g. scenarios or difficulty level) can be adapted at runtime based on an estimation of the trainee's mental state.

Various experiments have been performed to investigate the potential for inducing negative emotions using various virtual stimuli. Based on these experiments, physiological measurements such as heart rate, skin conductance and brain activity are compared with subjective ratings of a participant's mental state. Subsequently, the results acquired using virtual stimuli are compared with those that arise in a real-life setting. A first implementation of a virtual training for aggression de-escalation is evaluated. The final chapters discuss the use of (cognitive) models in a virtual training as well as methods to include adaptivity and physiological measurements.

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